DO CURRENT USE OF FORCE POLICIES REDUCE THE LEVEL OF INJURY FOR CIVILIANS AND OFFICERS? A STUDY OF THE EFFECTIVENESS OF EXISTING POLICE POLICIES AND HOW THEY CONTRIBUTE TO NATION-WIDE UPSET

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Abstract:

Current policing research evaluates effectiveness of added procedures boosting accountability, whether less lethal weapons are effective in replacing lethal weapons when force is required, or how policies differ across the nation. This article turns focus toward evaluating the existing use of force policing policy in one state. Six ordered logistic regression models were used to determine whether the policy as well as event characteristics reduce the level of severity of injury obtained in an encounter where force was applied for both civilians and officers and if the policy is effectively applied to all populations. The officer's perception of the civilian and the officer's intention in applying force were also considered. Given the tense climate between police and public, it is suspected and confirmed that the policy will not be effective nor universally applied. Following the policy does not slow the severity of injury sustained, nor impact all demographics equally.

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1. *Introduction*

In May of 2020, the world was shocked by the video of a White police officer, Derek Chauvin, kneeling on the neck of a handcuffed, Black man, George Floyd, for 9 minutes and 29 seconds, resulting Floyd's death.[1] Preceding Floyd's murder, a Black woman, by the name of Breonna Taylor, had been sleeping in her own bed when she was shot and killed during a failed raid in which police officers entered the wrong home.[2] Unarmed Black persons dying by the hands of police is not an uncommon occurrence. For at least the last six years, Black persons die by lethal police force at a statistically significant higher rate than all other races in the United States.[3] In this moment in 2020, however, the United States was quarantined, just like much of the world, in their homes due to the covid-19 pandemic, forcing them to pause and recognize a racial injustice between those in power and people of color that has been present in all parts of the fabric of this nation since its start. In the wake of these tragedies, movements and protests spanned the nation at a capacity unseen since the Civil Rights Movement of the 1950s and 1960s. The public called for accountability and for revisiting policing policies in order to stop the racial discrepancies in injury and lethal death of colored persons.

Historically, when the public perceives that the police fail to have accountability or when they perceive that minority groups within their society are unfairly treated by police, the public tends to lose trust in their police officers.[4] The loss of trust tends to make policing much more

[1] Levenson, Eric and Cooper, Aaron. "Derek Chauvin found Guilty of all Three Charges for Killing George Floyd." *CNN,* April 12, 2021, https://www.cnn.com/2021/04/20/us/derek-chauvin-trial-george-floyd-deliberations/index.html (accessed April 22, 2021).
[2] History.com editors. "Breonna Taylor is Killed by Police in Botched Raid." March 13, 2021, https://www.history.com/this-day-in-history/breonna-taylor-is-killed-by-police (accessed April 22, 2021).
[3] The Washington Post. "Fatal Force." https://www.washingtonpost.com/graphics/investigations/police-shootings-database/ (accessed April 23, 2021).
[4] Goldsmith, "Police reform and the problem of trust," *Theoretical Criminology* Volume 9, No. 4 (2005): 450-457

challenging as both sides lead to heightened fears and quicker reactions that result in lethal force.[5] Policing policies are built on a foundation that places the sole responsibility of an officer-civilian encounter on the civilian's actions. The lack of trust between police and public have culminated in a dangerous outcome that has proven challenging to address.

Current laws upheld by the Supreme Court allow for officers to protect themselves as they see necessary when feeling threatened. While the law stipulates that the context of the situation warrants threat, more times than not have the courts failed to bring charges against officers when their threat stemmed from racial bias and their actions led to unnecessary death.[6] Public frustration has resulted in much research attempting to address the need for accountability through evaluating additional measures to existing policies and practices. This approach tends to fall short because while footage of the incident may exist, the verdict of accountability often is determined by the threshold of feeling threatened without much regard to racial bias. Therefore, this article turns the focus towards researching existing use of force policies and their effectiveness in reducing both officer and civilian injuries during officer-civilian interactions.

The key policy focus of this article is the California use-of-force continuum in which the officer determines the level of force appropriate in an interaction with a civilian based on the actions of the civilian. If effective, following the policy should reduce the rate at which both officers and civilians are injured and there should be no demographic characteristics that that

[5] Goldsmith, "Policing Weak States: Citizen Safety and State Responsibility," *Policing and Society* Volume 13, No. 1 (2002): 3-4

[6] Stinson, Philip M. and Wentzlof, Chloe A. *On-Duty Shootings: Police Officers Charged with Murder or Manslaughter, 2005-2019*: Bowling Green State University, 2019.

result in higher injury. Using ordered logistic regression models, this research finds that when an officer does not use force, the level of injury for both officer and civilian decrease. However, when the use of force policy is used, both officers and civilians fail to obtain less severe injury. The injury level does not slow in a way that would parallel the severity of the situation as officers tend to be more severely injured when a civilian is assaultive over when a civilian is posing life-threatening resistance and officers are more likely to be more severely injured when the civilian does not resist at all. Encounter characteristics, civilian demographics, and officer demographics also significantly impact the level of injury. With these results, one can conclude that the use of force policy fails as it does not protect officers and civilians in a progressive way as the situation escalates, and it is not universally effective to all demographics, suggesting bias and a need to be revisited.

One major limitation of the findings surrounds the lack of comprehensive reporting after an officer-civilian interaction. Without reporting the adherence to policies surrounding the use of force, nor the adherence to fully report demographic characteristics, policy makers are unable to see a full picture in order to create responsive policy revisions.

In the following section of this article, a theoretical basis for this research will be established as well as a justification around the focus on existing use of force policies. The third and fourth sections of this article will describe the data, methods of analysis, and dive more deeply into key findings. This article will conclude with a discussion surrounding the limitation of the research, real-world implication of the findings, and suggestions as to where research may head next.

2. *Literature Review*

When evaluating the effectiveness of policing within the United States, as well as using theory to guide policing policy decisions, there are two theories that help capture the differing views within the United States around which policies and procedures are just and effective. These two theories are Social Interaction Theory and Trust Theory.

2.1 *Social Interaction Theory*

Social Interaction Theory was originally used to explain how children developed language through social cues. Ultimately, the theory posits that the outcomes of social interactions are determined by certain social factors present during the time of the interaction. These social factors include body language, presence of a third party, tone, and words used.[7] This theory helps explain many of the policing policy decisions in the 1990s. As applied to policing, Social Interaction Theory suggests that the social factors present during an interaction with a public citizen will determine whether or not the present police officer uses coercive action, which is action taken by the police officer to achieve the goal of compliant behavior.[8] When applied in this context, Social Interaction Theory places the responsibility of the final result on the public citizen—how the citizen behaves will determine the outcome of the encounter. The theory also places responsibility on the present police officer by insinuating that the police officer must pose a threat of coercive action that is feared by the citizen so greatly that hostile or violent encounters are avoided all together.

[7] Reisig, et al., "Suspect Disrespect Toward the Police," *Justice Quarterly* Volume 21, No. 2 (2004): 243
[8] Ibid.

Coupled with the Supreme Court ruling in the 1989 case *Graham v. Connor* upholding the right for police to protect themselves "within reason" from the public,[9] this theory around police behavior stemming from citizen behavior has birthed the policies around use of force. The most common policy approach to assessing the appropriate use of force during a police-public interaction involves a continuum. The behavior of the public citizen determines the action on the continuum that the police officer will take. These actions escalate from officer presence, verbal warnings, empty-hand control (bodily force such as grabs, holds, joint locks, punches, and kicks), less-lethal methods (use of submissive tools such as batons, projectiles, chemical pepper spray, and conductive energy devices), and finally lethal force (use of lethal weapons in order to gain control when the public citizen is deemed by the officer to pose a serious threat to either the officer or other person(s)).[10] Nearly 80% of policing agencies use these continuums, however, how they use them and what justifies each category of action can vastly differ from one agency to the next.[11]

Studies have found a few problems with Social Interaction Theory as applied to policing. For starters, in general, if police action escalates, the public citizen's reaction to the police officer does not tend to escalate in kind,[12] implying that Social Interaction Theory is not universally accurate when applied to policing. The only exceptions to this rule appeared to be whether the public citizen was intoxicated by drugs or alcohol, or whether the public citizen

[9] US Commissions of Civil Rights, "Police Use of Force: An Examination of Modern Policing Practices," *Briefing Report* (2018): 9
[10] US Commissions of Civil Rights, "Police Use of Force: An Examination of Modern Policing Practices," *Briefing Report* (2018): 10
[11] Terrill and Paoline, "Examining Lethal Force Policy and the Force Continuum: Results from a National Use-of-Force Study," *Police Quarterly* (2012): 1
[12] Reisig, et al., "Suspect Disrespect Toward the Police," *Justice Quarterly* Volume 21, No. 2 (2004): 245

displayed signs of mental illness. Additionally, neighborhood context may heavily influence the outcome of police-public encounters. Police perceiving a neighborhood as more dangerous or the public of a neighborhood perceiving the police as having a history of unfair policing within that neighborhood could influence the outcome of an encounter.[13] The actions in the police-public encounters is not always being influenced by the sole actions present in that sole encounter, but also by history of encounters or pre-conceived notions by officers around the threat level of a neighborhood, and thus this theory is unreliable as a foundation for policy decisions.

Another problem that arises within the scope of the application of Social Interaction Theory to policing is that the theory suggests, and some research affirms, though with conflicting outcomes,[14] that the presence of a third party may cause a police officer to over-react to a situation out of a need to assert their power and authority within the situation,[15] resulting in excessive force. Excessive force is when the officer chooses an action on the continuum that does not appropriately match the citizen's behavior. Social Interaction Theory and some research believe that third party presence may increase the likelihood of excessive force, and yet there are not existing parts of policy that address this tendency.

Research has found that placing responsibility on the public citizen's behavior as well as setting a standard for police to be threatening have led to policy issues that are challenging to navigate. Use of force policies give way to over-reaction and make it hard to hold police

[13] Reisig, et al., "Suspect Disrespect Toward the Police," *Justice Quarterly* Volume 21, No. 2 (2004): 246-249
[14] Bolger, "Just Following Orders: A Meta-Analysis of the Correlates of American Police officer Use of Force Decisions" *Southern Criminal Justice Association* (2014): 469
[15] Reisig, et al., "Suspect Disrespect Toward the Police," *Justice Quarterly* Volume 21, No. 2 (2004): 246-249

accountable. These glaring issues have led to public outcry. As a result, researchers then turned towards evaluating the public's interpretation of police action and the impact of trust on the effectiveness of the ability of the police to enforce the law.

2.2 *Trust Theory*

Researchers have found that public trust in police does improve the effectiveness of the police.[16] Trust in the police can significantly impact police ability to peacefully police and not need to use more severe forms of force against citizens.[17] When citizens feel secure and that the governing systems in which they live are just, they are more likely to trust the police.[18] The key factors that can negatively impact or diminish the trust between the public and the police are when the police uphold laws that have little to no public support, when the police act in ways that imply laws do not apply to them as they do to the public, demonstration of competence, the appearance of excessive force, intimidation, brutality, extortion, inconsistency, discrimination, police training to default towards suspicion, and the historical relationship between the police and the public.[19] The previously mentioned problems that arise with Social Interaction Theory and the policies that uphold the theory's principals lay the foundation for mistrust between the public and the police. How use of force is perceived by the public significantly contributes to the relationship of police-public trust, and how the public and the police perceive the justifiableness of use of force actions can differ greatly.[20]

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[16] Goldsmith, "Police reform and the problem of trust," *Theoretical Criminology* Volume 9, No. 4 (2005): 444
[17] Goldsmith, "Policing Weak States: Citizen Safety and State Responsibility," *Policing and Society* Volume 13, No. 1 (2002): 3-4
[18] Goldsmith, "Police reform and the problem of trust," *Theoretical Criminology* Volume 9, No. 4 (2005): 445-446
[19] Goldsmith, "Police reform and the problem of trust," *Theoretical Criminology* Volume 9, No. 4 (2005): 450-457
[20] Celestin and Kruschke, "Lay Evaluations of Police and Civilian Use of Force: Action Severity Scales," *Law and Human Behavior* Volume 43, No. 3 (2019): 299-303

When violent crime rates rise, police mistrust rises. Evaluating justifiability of force requires moral judgement. As mentioned, if police feel threatened, by law, they have the right to protect themselves. Both the public and the police agree that if a police officer's safety and life are threatened, then significant or lethal force is justifiable.[21] But, what if the perception of threat is influenced by discriminatory beliefs about a population or neighborhood? Is that the point at which the perception of justifiability of force differs from the view point of the public and the police?

Much research has been done to explore these questions, but the results have been indeterminate. The research in these efforts can be broken down by category: circumstances, suspect characteristics, and officer characteristics. Within the first category, there is inconclusive evidence from various studies around whether pressure to uphold the law enforcer role increases the likelihood of using force. The presence of a third party either in the form of other officers or other civilians has also had conflicting outcomes in various studies as to its role in excessive force. When looking at suspect characteristics, if a suspect appears intoxicated or to have mental health issues, or if the suspect is from a lower economic class, the suspect is more likely to experience force. However, suspect characteristics such as sex, race, and whether or not the suspect projected a hostile demeanor produce inconclusive results. Finally, the seemingly agreed upon police characteristic that impacts the use of force is education and training hours; if an officer has more education, the officer is less likely to use force. Other officer characteristics that have yielded differing results in the research are

[21] Celestin and Kruschke, "Lay Evaluations of Police and Civilian Use of Force: Action Severity Scales," *Law and Human Behavior* Volume 43, No. 3 (2019): 299-303

experience, attitude, sex, and race.[22] This type of research of exploring the contexts and characteristics that may lead to more use of force is important in addressing the issues of trust between the police and the public, but has been vastly stunted by major challenges in the reporting and access to data.

2.3. *Current Policy Research Trends and Challenges*

At this juncture, it is widely accepted that in order to have effective policing and law enforcement, the police must trust the public and the public must trust the police. Excessive force diminishes that trust. Accountability for excessive force is challenging to uphold due to the "objective reasonableness" standard upheld by the Supreme Court. What may be deemed as justified in the eyes of the police and the law may not be seen as justified force in the eyes of the public, worsening trust.

Due to the challenges in identifying characteristics in the context of police-public interaction that may lead to the use of force, simply avoiding or addressing such characteristics does not seem doable. Therefore, much of the current research and policy trends focus on what can be added to existing policies and practices in order to boost accountability. The accountability of the police directly relates to public trust of the police. Such research has involved number of in-service training hours received, type of training, and the wearing of body cameras. Many of these tactics have proven to be successful in reducing use of force in areas that apply such policies, however, not all states and jurisdictions within a state have the same policies. Therefore, the findings of such research are stunted in their usage because widespread

[22] Bolger, "Just Following Orders: A Meta-Analysis of the Correlates of American Police officer Use of Force Decisions" *Southern Criminal Justice Association* (2014): 468-471

application of these policies is not enforced. As a result, the fact still remains that death rates by police use of lethal force since 2015 have stayed relatively the same, and nearly 25% of all who die by police usage of lethal force displayed signs of mental illness during the encounter that led to death.[23] Trust does not improve.

Given these challenges, it is essential to have research to evaluate current police policies that are most lethal to the public. What policies need to be considered to be removed from practice and why might they cause the most deaths? Why have other approaches failed and will this approach be the most successful in reforming police policies so that death by lethal force declines? The research presented in this article will attempt to address the first question in hopes of laying foundations for actions that will help address the second question.

To answer these questions, this article turns the focus of research specifically on the California use of force policy. In order to evaluate whether or not the Californian use of force policy is effective, effectiveness must first be defined. With consideration of Social Interaction Theory and Trust Theory, as well as current national trends around the use of force, if the policy is effective, both civilians and officers on a whole should see the level of severity of injury when the policy is followed to rise more slowly than when it is not. Additionally, level of injury should directly respond to the civilians' actions towards the police officer in accordance to the theory on which the policy is based. Lastly, if the policy is effective, there should be no discrepancy of higher injury amongst the different demographic characteristics (race, sex, and age) nor amongst the mental state of a civilian as discrepancies may lead to heightened mistrust.

[23] Washington Post, "Fatal Force," (2015-2021)

3. *Data and Methods*

The data used in this research comes from Open Justice California. Open Justice is part of the Department of Justice and collects data on policing in hopes to achieve its mission of transparency and the ability to assess effectiveness in order to make necessary policy changes.[24] The data collected spans the entire state of California, but it does not include all law enforcement agencies. California law requires agencies to report on incidents that result in serious bodily harm or when a firearm is discharge. The extent of required reporting is unclear. Therefore, not all incidents are reported. 2016 was the first year in which this initiative collected data and this may be the reason for incomplete or missing information within the reported incidents or perhaps because of unclear standards of thoroughness of reporting.

This study uses the "URSUS – Use of Force" data-- in particular, the "Civilian-Officer 2016" data-- because it reports on not only whether force was used and if an officer followed the continuum of force procedures, but also includes characteristics around the incident, civilian, and officer. The data from 2016 was chosen because of its vastness in data points far exceeding the other years. Many of the variables allow for multiple category entries. Per Open Justice's recommendation, where this occurs, variable entries were recoded to the most severe of the entries in any given incident. For example, if an entry noted that the officer's reason for force was both to affect arrest and to overcome resistance, the reason would be recoded to the more severe reason of overcoming resistance to allow for easier data management and analysis.

[24] California Department of Justice. "Open Justice." https://openjustice.doj.ca.gov/.

There are 782 cases reported of officer-civilian interactions in this data set. The data includes a line for each person present during the incident, resulting in more than one line of data per incident. The racial makeup of civilians and officers within the data are as follows:

Table 1: Civilian and Officer Racial Demographics

	Civilian	Officer
White	250	977
Hispanic	351	548
Black	163	59
Native American	5	4
Indian	2	5
Pacific Islander	30	83
Mixed/Other	17	53

Data Source: Open Justice DOJ CA Use of Force Civilian-Officer

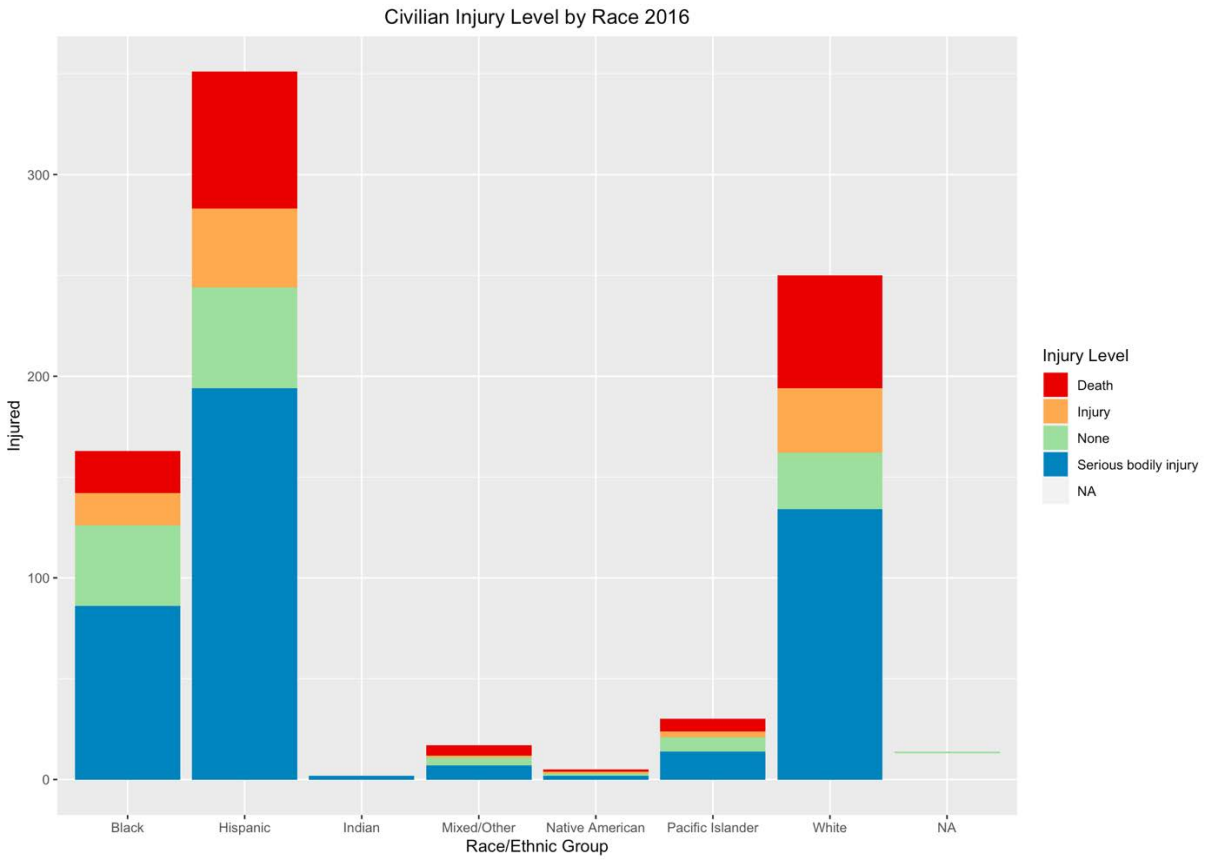
During 2016, Hispanics made up the majority of the population in California, followed by Whites, and yet the number of White police officers is nearly double that of Hispanic police officers. Additionally, Black persons made up only 6.5% of the California population and yet nearly 20% of the involved civilians. Pacific Islanders made up 0.5% of the total population in 2016, and yet are a greater proportional presence both as civilians and officers than they are in the racial makeup of the state.[25]

In order to determine the effectiveness of the use of force continuum used in California, the dependent variable in this study is injury level. It is an ordinal variable with categories of "Death", "Serious bodily injury", "Injury", "None", and "NA". Incidences where the designation "NA" occurs, the officer failed to report the information of that variable. The same reasoning is applied to "NA" designations of race or any other variable within the data set. Failure to report

[25] Census Bureau. "Quick Facts California." https://www.census.gov/quickfacts/fact/table/CA/PST045219.

may suggest that there was no serious bodily injury resulting from the incident and therefore was not required to by law. The following figure displays the Civilian Injury Level by race.

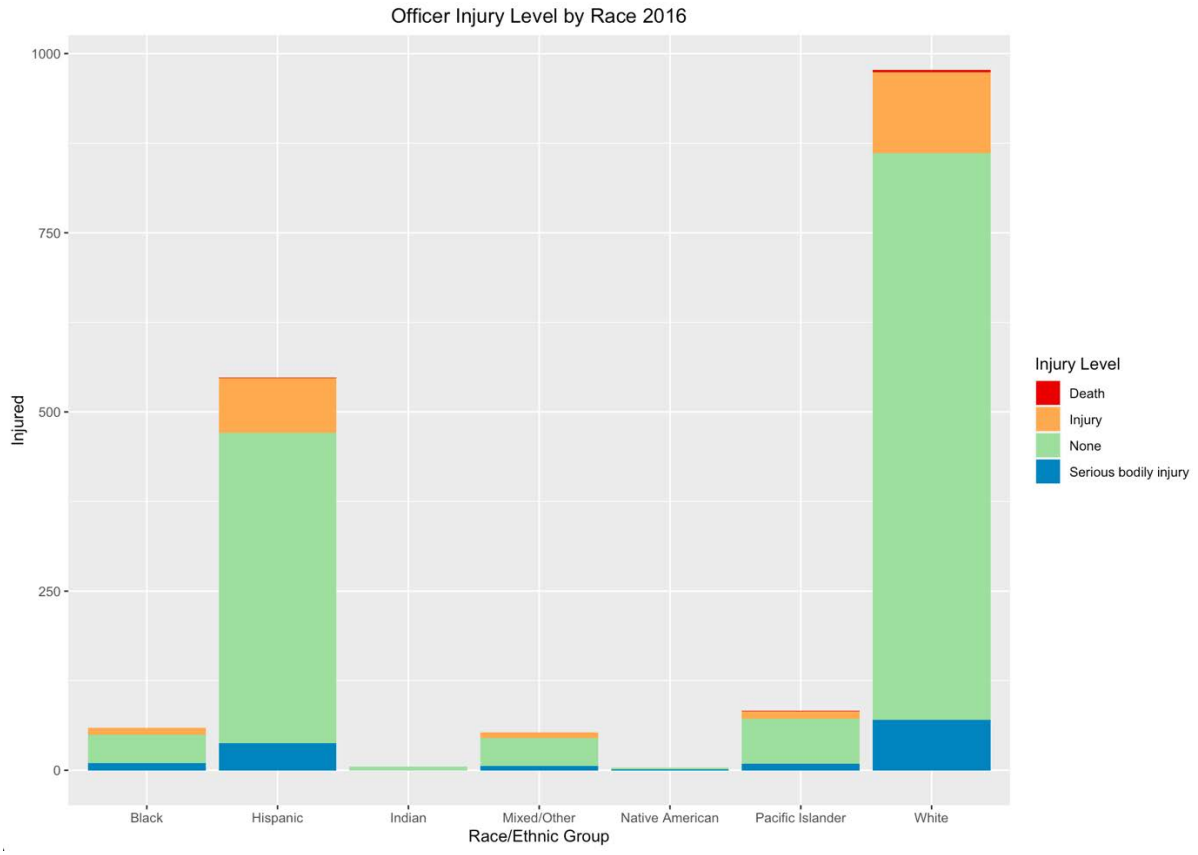
Figure 1: Civilian Injury Level by Race



Data Source: Open Justice DOJ CA Use of Force Civilian-Officer

The injury to race breakdown for civilians largely follows the racial breakdown of the state at the time with the exceptions of Blacks and Pacific Islanders. Both these two races have a higher rate of injury as a total than would be expected given census data around the time. This may signal that the results may yield in racial inequities of injury level and may predict a failure in policy. Alternatively, figure 2 demonstrates the Officer Injury Level by the officer's race.

Figure 2: Officer Injury Level by Race



Data Source: Open Justice DOJ CA Use of Force Civilian-Officer

On a whole, the majority of officers, regardless of race, report no injury. The injuries reported do seem to follow rates similar to the 2016 racial makeup of California, which cannot be concluded for civilians. These two figures at first glance signal the need to not only test the impact of following the use of force policy on civilian and officer injury levels, but also demographic characteristics such as race, age, and sex. Modern civil rights movements, such as Black Lives Matter, spotlight not only racial discrepancy in individuals fatally shot, but also age and sex discrepancy, further demonstrating a need for demographic variables to be included within the regression models. Table 2 displays the age and gender distribution of civilians and officers reported in the data. (See appendix Figure 1 for a visual representation of the age

distribution for civilians and officers.) The vast majority of civilians reported in this data are males in their 20s. The vast majority of officers are in their late 20s and early 30s. Officers are also overwhelmingly male.

Table 2: Civilian and Officer Age and Gender

	Civilian	Officer
Under 18	32	0
18-20	73	0
21-25	138	141
26-30	161	385
31-35	121	480
36-40	102	284
41-45	65	224
46-50	54	157
51-55	36	40
56-60	25	15
61-65	3	3
66-70	2	0
71-75	5	0
86-90	1	0
MALE	768	1642
FEMALE	50	87

Data Source: Open Justice DOJ CA Use of Force Civilian-Officer

With much research centering on interventions of those displaying signs of mental impairment either due to disability,[26] the independent variable of mental state is included. This variable is ordinal with the categories of civilian behavior displaying signs of a mental or physical disability, alcohol or drug impairment, both, or none. With the news focused on unarmed persons and racial bias, related independent variables are included that identify whether or not the civilian appeared to be armed, if and how the civilian resisted the officer, and the officer's reason for using force—all ordinal variables. Because the independent variable

[26] Compton, Michael T., Masuma Bahora, Amy C. Watson, and Janet R. Oliva. "A Comprehensive Review of Extant Research on Crisis Intervention Team (CIT) Programs." *The Journal of the American Academy of Psychiatry and the Law* 36, no. 1 (2008): 47-55, https://www.ncbi.nlm.nih.gov/pubmed/18354123.

used in this study is ordinal, an ordered logical regression will be used in a series of models with the intent to gauge the effectiveness of the use of force policy within California. It is hypothesized that the results will conclude in a failure of policy based on the established criteria not only because of the demographic breakdown discrepancies seen in reviewing the data, but also because of the tense political climate within the country.

4. *Results*

As previously mentioned, ordered logical regression models were used to evaluate the effectiveness of the sliding scale policy. All models used level of injury as the dependent variable. The first model used whether or not the officer followed policy and whether or not force was used in the reported incident as independent variables. The intention of the model is to establish a baseline around using force and the coordinating policy. Odds ratios were then calculated to better interpret the results, which are listed below in table 3.

Table 3: Impact of Force on Injury Level

	Civilian Injury Level		**Officer Injury Level**	
	Coefficient	*Odds Ratio*	*Coefficient*	*Odds Ratio*
Officer Used Force: TRUE	2.45***	11.61***	0.26	1.30
Officer Used Force: FALSE	Reference Category	Reference Category	Reference Category	Reference Category
Followed Policy: TRUE	0.29	1.34	-0.06	0.93
Followed Policy: Fail to report	0.05	1.05	-0.78***	0.45***
Followed Policy: FALSE	Reference Category	Reference Category	Reference Category	Reference Category

* denotes statistical significance at the .1. **denotes statistical significance at .05 *** denotes statistical significance at .01
Data Source: Open Justice DOJ CA Use of Force Civilian-Officer

The coefficients determine the significance of the variables' relationship as well as the direction of the relationship. Unsurprisingly, when the officer uses force, the injury severity level of the civilian significantly increases and the odds of more severe injury is 11.61 times greater than if no force is used. Interestingly, this model reports that there is no significant impact to civilian severity of injury when an officer followed the use of force policy or failed to report whether the policy had been followed, signaling potential policy failure.

There appears to be no significant change in the severity of officer injury level when the officer uses force. However, when the officer fails to report whether he/she followed policy,

the officer's injury level significantly decreases demonstrated by the coefficient value -0.78. The odds of an officer sustaining more severe injury becomes 0.45 times less likely than when the officer does report whether he/she followed policy. One might conclude that this result is due to the incident not requiring reporting because a firearm was not discharged or perhaps because the incident resulted in no major outcomes that it did not seem important to report. It is interesting, however, that using force does not seem to protect the officer, but does seem to injure civilians more severely. It is also interesting that reporting adherence to the use of force policy seems to make no significant impact in either direction for both civilian and officer injury level, further signaling policy failure.

To dive more deeply, four more models were conducted by expanding upon the demographic and incident characteristics in the lists of independent variables. The dependent variable remained the same, however. Table 4 provides the results of the most complete model's ordered logical regression as well as the corresponding odds ratios.

Table 4: Impacts of Incidents' Characteristics on Civilian and Officer Injury

	Civilian Injury Level (Model 4)		Officer Injury Level (Model 4)	
	Coefficient	*Odds Ratio*	*Coefficient*	*Odds Ratio*
Followed Policy: TRUE	0.36*	1.43*	-0.03	-0.96
Followed Policy: Failure to report	0.23*	1.26*	-0.78***	0.45***
Followed Policy: No Force Used	-2.18***	0.11**	-0.23	0.79
Followed Policy: FALSE	Reference Category	Reference Category	Reference Category	Reference Category
Reason: Prevent escape	-0.84***	0.43*	-0.03	0.96
Reason: Arrest/Custody	-0.11	0.89	-0.16	0.85
Reason: Overcome resistance or No Force Used	Reference Category	Reference Category	Reference Category	Reference Category
Race: Native American	-0.28	0.75	0.79	2.21
Race: Indian	0.85***	2.34***	-12.74***	2.91e-06***
Race: Pacific Islander	-0.37	0.68	0.37	1.45
Race: Hispanic	0.11	1.12	0.10	1.10
Race: Black	-0.42***	0.65***	0.86***	2.38***
Race: Mixed/ Other	0.09	1.07	0.61*	1.85*
Race: Failure to report	-0.47	0.62	N/A	N/A
Race: White	Reference Category	Reference Category	Reference Category	Reference Category
Sex: Male	0.56***	1.76***	-0.31	0.73
Sex: Female	Reference Category	Reference Category	Reference Category	Reference Category
Mental State: Signs of development or mental disability	0.43	1.51	-0.01	0.98
Mental State: Signs of substance impairment	-0.38	0.66	0.60***	1.83***
Mental State: None	-0.41	0.65	0.27	1.32
Mental State: Signs of disability and substance impairment	Reference Category	Reference Category	Reference Category	Reference Category
Age: >= 17	0.12	1.13	N/A	N/A
Age: 18-20	-0.46	0.62	N/A	N/A
Age: 21-25	-0.23	0.79	0.06	1.06
Age: 26-30	Reference Category	Reference Category	0.00	1.00
Age: 31-35	0.29	1.34	Reference Category	Reference Category
Age: 36-40	0.27	1.31	-0.11	0.88
Age: 41-45	0.18	1.20	-0.22	0.79
Age: 46-50	0.35	1.42	-0.37	0.68
Age: 51-55	0.34	1.40	0.00	1.00
Age: 56-60	0.98***	2.67***	-1.01	0.36
Age: 61-65	2.47***	11.87***	1.82	6.21
Age: 66-70	0.40	1.49	N/A	N/A
Age: 71-75	1.75	5.76	N/A	N/A
Age: 86-90	4.46***	86.53***	N/A	N/A

* denotes statistical significance at the .1; **denotes statistical significance at .05; *** denotes statistical significance at .01

Data Source: Open Justice DOJ CA Use of Force Civilian-Officer. Note: Only Model 4 is displayed as it is the most complete.

Model four suggests that following the use of force policy impacts injury level differently for civilians and officers. When the officer follows the policy or fails to report whether the policy was followed, the severity of civilian injury significantly increases with statistically significant coefficients of 0.36 and 0.23 respectively. Civilians are 1.43 times more likely to be more severely injured when the policy is followed in comparison to all other policy compliance scenarios, and 1.26 times more likely to be more severely injured when the officer fails to report whether policy was followed in comparison to all other policy compliance scenarios. Unsurprisingly, if no force was used, the civilian injury level significantly decreases and civilians are 2.18 times more likely to sustain less injury than during all other policy compliance scenarios.

Alternatively, the only statistically significant result for officer injury for this variable is when the officer fails to report the use of the policy-- the severity of officer injury decreases. Failure in reporting tends to result in officers becoming 0.45 times more likely to sustain less severe injury than during all other policy compliance scenarios. This result suggests that the hypothesis that the officers' reduction in odds for more severe injury was due to the incident not resulting in severe enough injury for the incident to be reported is false because civilian injury is increasing at these times.

Furthermore, the officers' reason for using force as well as the race, sex, and age of the civilian all yield significant results in how they impact the level of civilian injury. If the officer's intention in using force was to prevent escape, the odds of severe civilian injury decrease 0.43 times in comparison to other officer reasons. When looking at how race impacts injury level, those who are recorded as Black sustain significantly less severe injury by 0.65 times. Civilians

who identify as Indian are 2.34 times more likely to sustain more severe injury. When looking more closely at the results around the characteristics of civilians' race, every civilian Indian reported in an incident was injured to some degree. As the race White was used as a reference category and Black civilians had less in number as well as ratio for some of the most serious injuries despite having a higher total injury rate, this may explain the results for Black civilians.

Nationally, Black persons die at the hands of police officers at a far higher rate than all other races. While there are racial inequities in rates of more severe injury, California's rates differ from the national rates during 2016. One may wonder what races are in the failed to be reported category. For incidences missing race information, they also are missing sex, age, and injury level information. What is reported in the data for incidences that are not completely reported are the resistance of the civilian and the reason for which the officer used force. In the majority of such cases, the civilian was resisting to some degree. Most interestingly, of these incidences, all but one included a discharged firearm. By California law, all of these should therefore be reported, however, they are not fully and there is no reasoning as to why in the data explanation provided by Open Justice CA. While this is curious, the results yielded by unreported race are insignificant and therefore do not explain why California differs from national trends of civilian racial inequity in sustaining severe injury by police.

While mental state did not significantly impact civilian injury level, gender and age did. If a civilian is male, the civilian is 1.76 times more likely to be more severely injured than if the civilian is female. Unsurprisingly older civilians tend to incur more severe injury. Civilians who are 56 to 60 years of age are 2.67 times more likely to be more severely injured in comparison to their counterparts, civilians 61 to 65 years of age are 11.87 times more likely to sustain more

severe injury, and civilians 86 to 90 years of age are 86.53 times more likely to sustain more severe injury than their counterparts.

It is important to note that more age groups in the data exist for civilians than for officers as the age groups for officers' age categories span a career and not a lifetime. Age and gender make no significant impact to officer injury. Officers' race and civilian substance impairment did. Officers who identify as Indian are 2.91e-06 times less likely to sustain more severe injury than their counterparts. Officers identifying as Black are 2.38 times more likely to sustain more severe injury, and officers that identify as mixed race or other are 1.85 times more likely to obtain more severe injury than their counterparts. Looking more closely at these results for officers' injury level, no Indian officers sustained injury. Nearly half of the Black officers did sustain injury of some level which is a rate of injury much larger than the other officers' races. Officers considered Mixed/Other also similarly have a much higher rate. A civilian having a mental or physical disability did not significantly impact officer injury, but if a civilian's mental state was impaired by drug or alcohol use, officer injury is 1.83 times more likely to increase.

The mental state of a civilian had no significant impact on civilian injury. The mental state of civilians with disabilities had no significant on officer injury severity. Interestingly, mental state altered by substance impairment resulted significantly in officers sustaining more serious injury. This finding is interesting as much current research is focusing towards helping reduce injury where civilians mental state is altered because of disability or psychiatric reasons, where the data in California does not support this focus need.

Much of the outcry of the Black Lives Matter movement surrounds unarmed Black persons dying at the hands of officers. Thus, in Model 5, explorations into civilian actions as well as the officer's perception whether the civilian was armed were further explored. Injury level remains the dependent variable. The results and accompanying odds ratios are displayed in table 5.

Table 5: Impact of Perceived Civilian Behavior on Civilian and Officer Injury

	Civilian Injury Level (Model 5)		**Officer Injury Level (Model 5)**	
	Coefficient	*Odds Ratio*	*Coefficient*	*Odds Ratio*
Followed Policy: TRUE	0.16	1.17	-0.09	0.90
Followed Policy: Failure to report	-0.22	0.79	-0.45***	0.63***
Followed Policy: No force used	-2.67***	0.06***	-0.11	0.89
Followed Policy: FALSE	Reference Category	Reference Category	Reference Category	Reference Category
Perceived Armed: TRUE	0.67*	1.96***	-0.34*	0.70*
Perceived Armed: FALSE	Reference Category	Reference Category	0.07	1.07
Perceived Armed: Failure to report	Reference Category	Reference Category	Reference Category	Reference Category
Resistance: Active resistance	0.00	1.00	1.66	5.28
Resistance: Assaultive	-0.23	0.79	2.55***	12.89***
Resistance: Life-threatening	0.51	1.68	1.81*	6.12*
Resistance: Failure to report	0.00	0.99	0.59	1.82
Resistance: FALSE	-1.88***	0.15***	3.20***	24.54***
Resistance: Passive non-compliance	Reference Category	Reference Category	Reference Category	Reference Category

* denotes statistical significance at the .1; **denotes statistical significance at .05; *** denotes statistical significance at .01

Data Source: Open Justice DOJ CA Use of Force Civilian-Officer

Note: Where two reference categories exist, one category did not include enough data points to be its own category within the model.

In this model, civilian injury level again is not significantly impacted when the policy is followed nor when the officer fails to report adherence to the policy. Additionally, this model affirms the finding that not using force reduces civilian injury and civilians are 0.06 times less likely to become more severely injured than all other compliance scenarios. As found in previous models, officer injury is significantly likely to decrease when the officer fails to report

whether policy was followed. In these cases, officer injury is 0.63 times more likely to decrease. If the civilian was perceived armed by the officer, the civilian's injury level is 1.96 times more likely to increase, while the officer's injury level 0.70 times more likely to decrease. Perhaps the officer injury reduces when they perceive a civilian to be armed because they respond more quickly than they would if a weapon was not seen.

If the civilian displayed no resistance to the officer, the civilian's injury level significantly decreases while the officer's significantly increases. The civilian is 0.15 times less likely to be more severely injured than the civilian's counterparts, and the officer is 24.54 times more likely to be injured than the officer's counterparts. The significant boost in officer injury when civilians do not resist is curious and the reasoning most likely lies in the events at the onset of the civilian-officer interaction. Additionally, if a civilian is assaultive or engaging in life-threatening resistance, the officer's injury level significantly increases. In these circumstances, officers are 12.89 and 6.12, respectively, times more likely to be injured more severely than when civilians partake in other categories of resistance.

As mentioned previously, if the California use of force policy was effective, the results should demonstrate a slowing in severe injury for both officers and civilians when the policy is followed and there should be no demographic biases. The results from all performed models deem the use of force policy within California ineffective because following the policy does not result in these criteria. Injury level is not slowed for officers and civilians. The injury also does not follow a logical pattern with life threatening resistance resulting in a smaller likelihood of severe injury for officers in comparison to less lethal resistance. The policy does not have consistent results across demographics and amongst the mental state of civilians. Differing

results amongst demographic categories suggest that the current use of force policy fails to address biases that in turn yield more severe injury for specific groups of people.

5. *Conclusion*

Police and public relations in the United States have increasingly come to the forefront of modern civil rights outcries as young men of color die each year at on overwhelmingly larger rate than their White counterparts. As a result, more initiatives across the country have focused on increasing officer accountability by adding practices like the wearing of body cameras, increased incident reporting, and increased sensitivity training. These additions have fallen short because there is a failure to adopt such policies universally and because of the Supreme Court ruling upholding an officer's right to use reasonable force when feeling threatened. As a result, this research focused mainly on the existing use of force policies—particularly the continuum of force—and their effectiveness on preventing unnecessary severe injury or death.

Ultimately, this research finds that the sliding scale policy is not optimally effective as it fails to slow the severity of injury when it is followed in comparison to when an officer failed to report if the policy was followed. The severity of injury does not appear to slow when following the policy and the level of civilian resistance does not seem to impact civilian and officer injury level in the anticipated gradual increase, also signaling that the policy is ineffective. Additionally, civilian and officer demographics appear to play a significant role in sustained injury, signaling a policy that is not equally applied to all demographics. The results do not support the need for more sensitivity training around mental and physical disability, but do support additional sensitivity training around sex, race, age, and substance impairment. The results of the analysis performed in this study conclude that the continuum of force policy in California is not working as intended and therefore ineffective. The results call for future research to be done around how the policy can be altered or redone in order to also

accommodate demographic characteristics and substance impairment in order to boost the safety of both civilians and officers. Such work requires research on reducing bias as well as sensitivity training for all these populations.

A major limitation to the research is incomplete reporting. In many incidences, not all fields were fully filled out. These failures of reporting yielded significant results. By California law, if a firearm was discharged, the incident needs to be reported. Beyond that, there does not seem to be a requirement around how much detail of the incident needs to be reported. Therefore, incidences where firearms were discharged but only a few incident characteristics were documented still qualify as reporting the incident under the law. Uniform reporting from incident to incident and precinct to precinct does make it challenging to obtain an accurate picture of what is happening when officers follow the continuum of force compared to when they do not. Additionally, the force continuum is commonly practiced across much of the country, but differs from state to state and county to county. This is a trend seen by many policing policies. While it is imperative to take into account operating context of each precinct, general policies such as the sliding scale policy, incident reporting, and other practices becoming uniform may better help precincts and policy makers address the issues facing the relationship between police and public.

Future research may want to explore whether jurisdictions that have more relaxed reporting have more severe injury outcomes. Further research may also want to explore whether injury and death occurs more regularly in jurisdictions that meet minimal reporting requirements and do not follow a continuum of force policy. Why does incomplete reporting occur? Within these incidences, are the demographic characteristics not reported out of fear of

public outcry? How do officers' feelings of trust towards the public impact injury level or incident reporting?

Besides the lack of uniform reporting, one of the biggest challenges facing the initiative and desire of holding police officers accountable for excessive force is the Supreme Court ruling in the 1989 case *Graham v. Connor* upholding of officers protecting themselves within objective reason when threatened. Without limitations around what actions can make officers feel threated, more often than not, police officers fail to be indicted for killing unarmed persons. The law often fails to take into consideration biases held by officers that contribute to a feeling of threat. Therefore, research around meaningful accountability measures that help boost accountability not just for transparency to the public, but accountability upheld by law.

Ultimately, more comprehensive data reporting around more policies can boost the effectiveness of policy reform. Much work remains to be done in order to address the public-police relations within this country. More comprehensive investigations to existing policies remain to be done. Combining existing research around trust and accountability with evaluating current policies and laws has the potential to be a powerful starting point for policy makers to make the change the public desperately desires.

6. *Works Cited*

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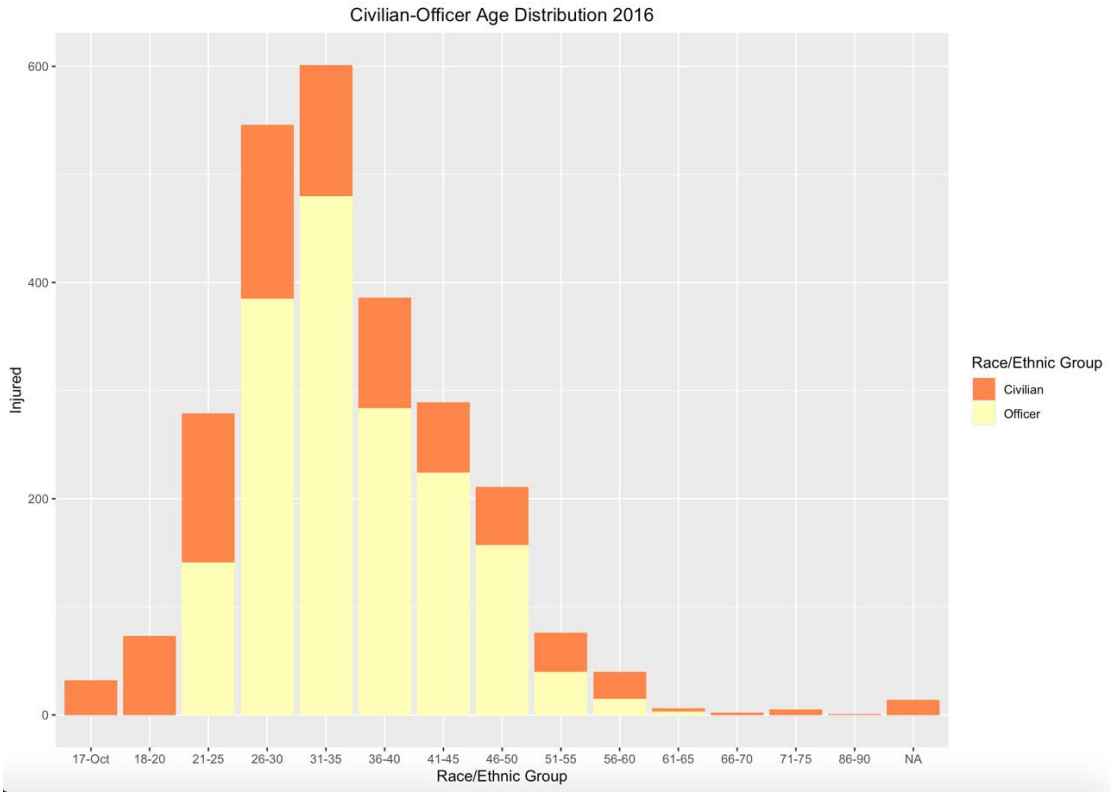
7. *Appendices*

Figure 1: Civilian-Officer Age Distribution 2016



Data Source: Open Justice DOJ CA Use of Force Civilian-Officer

8. *Curriculum Vita*

The Masters in Data Analytics and Policy curriculum taught the needed skills in order to complete this project. “Applied Performance Analytics” contributed to fundamentals of using Excel in order to clean the data before importing the data into R. The core classes of “Statistics and Political Analysis”, “Quantitative Methods”, “Programming and Data Management”, “Data Visualization”, and “Data Science and Policy” taught the necessary statistical software skills for using R and Stata in order to complete this project. Once missing information was cleaned in Excel, the data was imported into R where further cleaning techniques were used.

After the data was imported in R, R functions, such as the table function, were used in order to identify demographic characteristics of the data reported in the *Data and Methods* section of this article. R coding was further used to relabel variables and assign ordinal variables numeric values. Then, a new CSV file was created by exporting the new cleaned and organized data into two separate files—one for civilians; one for officers. From there, the new files were imported into Stata in order to run ordered logical regressions.

To further explore curious outputs and results, tables and figures were created in R to gain a better understanding of the results of the regressions in Stata. The “Data Visualization” curriculum around the ggplot function aided in the creation of all of the figures present within this article.

All courses aided in the interpretation of the statistical outputs of the ordered logical regression models. The curriculum provided the means to interpret coefficients. The curriculum also provided the means by which to calculate the statistical significance by dividing the

coefficient by the robust standard error. The degree of statistical significance was determined by the resulting z-score value.

Course work in nonprofit evaluation added in the knowledge of identifying criteria around what deems a program effective or ineffective. Course work in “Public Opinion” aided in the inclusion of national context to the relevance and importance of the research conducted in the article.